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2010 MARTEN AND FISHER HARVEST SURVEY

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ABSTRACT

A survey was completed to determine the number of harvest tag holders who set traps for marten and fisher, the number of animals caught, the types of traps used, and the number of days spent trapping. In 2010, 1,547 furtakers obtained a harvest tag to trap marten or fisher, compared to 1,292 tag holders in 2009 (20% increase). About 32% of the tag holders set traps specifically for marten (492 trappers) and 32% set traps for fisher (493). These trappers spent about 3,866 days trapping marten, captured 351 marten, and registered 290 marten. An additional 86 marten were caught in traps of trappers targeting other species, and 6 of these non-target marten were registered. The number of trappers seeking marten increased 19%, and their trapping effort increased 24% between 2009 and 2010. However, the effort per registered marten and the number of marten registered by all trappers did not change significantly between 2009 and 2010. An estimated 493 trappers spent 4,942 days trapping fisher, captured 353 fisher, and registered 311 fisher. An additional 125 fisher were caught in traps of trappers targeting other species, and 16 of the non-target fisher were registered. The number of trappers seeking fisher increased 24%, their trapping effort increased 31%, and the number of fisher registered by all trappers increased 41% between 2009 and 2010. However, trapper effort per registered fisher was not significantly different between 2009 and 2010.

INTRODUCTION

The Natural Resources Commission and Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. Harvest surveys are important management tools used to help accomplish this statutory responsibility. The main objectives of this harvest survey were to determine the

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number of trappers who set traps for marten (*Martes americana*) and fisher (*M. pennanti*), the types of traps used, the number of days trapped, and the number of animals captured.

Efforts to restore the American marten and fisher have been successful throughout the Upper Peninsula (UP) (Williams et al. 2007). As a result, the first modern fisher trapping season was initiated in 1989, and the first modern marten trapping season was initiated in 2000.

In 2010, the marten and fisher trapping season was 15 days in the UP (December 1-15). The entire UP, except Drummond Island and the Pictured Rocks National Lakeshore, was open to marten and fisher trapping. In order to trap either marten or fisher, trappers were required to obtain a free harvest tag, in addition to a Fur Harvester License. Trappers were limited to one marten and three fisher, except no more than one fisher could be taken in Management Unit B (Figure 1). Successful trappers were required to register all fisher and marten taken by December 20, 2010. If trappers captured more animals than allowed to keep or caught animals outside of the season (incidental captures), these trappers were required to release these incidental captures alive. If these incidental captures could not be released alive, trappers were required to bring these incidental catches to a registration station. The DNR kept incidental captures. Trappers could use body-gripping (e.g., conibear) traps and foothold traps to capture marten and fisher. Live traps were also legal if set within 150 yards of a residence or farm building.

METHODS

A questionnaire was sent to everyone who obtained a marten or fisher trapping permit in 2010 (1,547 permit holders). Trappers receiving the questionnaire were asked to report if they set traps for marten or fisher, number of days spent afield, number of marten and fisher caught and released alive, and number of marten and fisher registered (registration estimates included incidentally caught animals that were not returned to the trapper). Trappers were asked to report whether any marten and fisher captured were taken in traps set for them or taken in traps set for another species. Trappers were also asked to indicate their impression of the status of the marten and fisher populations in the county where they primarily trapped (i.e., absent, stable, increasing, or decreasing).

Although all permit holders were sent a questionnaire, not everybody returned their questionnaire. To extrapolate from the tag holders that returned their questionnaire to all people obtaining harvest tags, estimates were calculated using a stratified random sampling design that included three strata (Cochran 1977). Trappers were stratified based on the type of harvest tags obtained (i.e., marten tags only [34 trappers], fisher tags only [47], or both tag types [1,466]). The statewide estimate of the mean number of days required to harvest a marten and fisher was calculated using a different ratio of effort to harvest for each stratum (i.e., separate ratio estimator). The number of animals registered for each stratum was used as an auxiliary variate to improve the precision of ratio estimates.

A 95% confidence limit (CL) was calculated for each estimate. In theory, the CL can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies that the true value would be within this interval 95 times out of 100. Unfortunately, there are several other possible sources of error in surveys that are probably more serious than theoretical

calculations of sampling error. They include failure of participants to provide answers (nonresponse bias), question wording, and question order. It is very difficult to measure these biases; thus, estimates were not adjusted for these possible biases.

Statistical tests are used routinely to determine the likelihood that the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating that the difference between the means was larger than would be expected 995 out of 1,000 times, if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially during mid-January 2011, and up to two follow-up questionnaires were mailed to nonrespondents. Questionnaires were undeliverable to 36 harvest tag holders. Questionnaires were returned by 991 of 1,511 people receiving the questionnaire (66% response rate).

RESULTS AND DISCUSSION

In 2010, 1,547 trappers obtained harvest tags to trap either marten or fisher, compared to 1,292 tag holders in 2009 (20% increase). Marten harvest tags were obtained by 1,500 trappers, and fisher harvest tags were obtained by 1,513 trappers. Men obtained most of the marten and fisher harvest tags (1,468). Women obtained 77 harvest tags, and the sex of two tag holders was unknown.

Marten

About 32% of the marten and fisher tag holders set traps specifically for marten (492 trappers, Table 1). About 57 ± 3% of these trappers successfully captured at least one marten. The trappers targeting marten spent 3,866 days trapping ($\bar{x}$ = 7.9 ± 0.4 days/trapper), captured 351 marten, and registered 290 marten (Table 2). An additional 86 marten were caught in traps of trappers targeting another species, and 6 of these non-target marten were registered. Among trappers seeking marten, the greatest numbers of marten were captured in Chippewa (58), Marquette (53), Luce (47), and Baraga (45) counties.

Between 2009 and 2010, the number of trappers targeting marten increased 19% (492 versus 413 trappers) and their trapping effort increased 24% (3,866 versus 3,114 days, Figure 2). The number of marten registered by all trappers (included trappers targeting marten and trappers that caught non-target marten) did not change significantly between 2009 and 2010 (296 versus 285 marten, Figure 2). Among trappers targeting marten, the mean number of days of effort per registered marten was 13.3 ± 1.1 days in 2010, which was not significantly different from the estimate from 2009 (11.6 days, Figure 3).

The mean number of days of effort per registered marten was correlated with the mean value of marten pelts during 2000-2010 (Pearson product moment correlation coefficient [r] = 0.73, probability of obtaining this result [P] = 0.01) (Figure 4). The correlation between trapping effort and pelt prices (r = 0.67, P = 0.03) was also significant.

Most trappers used body-gripping type traps (e.g., conibears) to capture marten (83 ± 3%), although foothold traps also were used frequently (30 ± 3%). Among trappers using body-

gripping traps, the mean number of body-gripping traps set per day was 4.8 ± 0.4. Among trappers using foothold traps, the mean number of foothold traps set per day was 4.0 ± 0.3.

Thirty-six percent of marten trappers (±3%) believed marten numbers were increasing in the county where they trapped most often, while 32 ± 3% thought marten numbers were stable, 5 ± 1% thought marten were declining, 3 ± 1% indicated marten were not present, and 23 ± 3% did not comment on the status of marten.

Fisher

About 32% of the marten and fisher tag holders set traps for fisher (493 trappers, Table 1). About 42 ± 3% of these trappers successfully captured at least one fisher. Trappers targeting fishers spent 4,942 days trapping (10.0 ± 0.4 days/trapper), captured 353 fisher, and registered 311 fisher (Table 3). An additional 125 fisher were caught in traps of trappers targeting another species, and 16 of the non-target fisher were registered. Among trappers seeking fisher, the greatest numbers of fisher were captured in Ontonagon (56) and Marquette (53) counties.

Between 2009 and 2010, the number of trappers targeting fisher increased 24% (493 versus 398 trappers) and their trapping effort increased 31% (4,942 versus 3,773 days, Figure 5). The number of fisher registered by all trappers (included trappers targeting fisher and trappers that caught non-target fisher) increased 41% between 2009 and 2010 (327 versus 232 fisher, Figure 5). Among trappers targeting fisher, the mean number of days of effort per registered fisher was 15.9 ± 1.4 days in 2010, which was not significantly different from the estimate for 2009 (17.0 days, Figure 6).

The mean number of days of effort per registered fisher was not significantly correlated with the mean value of fisher pelts during 1997-2010 ($r = 0.46$, $P = 0.1$; Figure 7). In contrast, the correlations between the number of trappers and pelt prices ($r = 0.65$, $P = 0.01$) and between trapping effort and pelt prices ($r = 0.63$, $P = 0.02$) were significant.

Most trappers used body-gripping traps (e.g., conibears) to capture fisher (81 ± 3%), although foothold traps also were used frequently (36 ± 3%). Among trappers using body-gripping traps, the mean number of body-gripping traps set per day was 5.6 ± 0.5 traps. Among trappers using foothold traps, the mean number of foothold traps set daily was 4.3 ± 0.4 traps.

Fifteen percent of fisher trappers (±2%) believed fisher numbers were increasing in the county where they trapped most often, while 37 ± 3% thought fisher numbers were stable, 20 ± 3% thought they were declining, 4 ± 1% indicated fisher were absent, and 23 ± 3% did not comment on the status of fisher.

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Table 1. Estimated harvest tag holders that attempted to trap marten or fisher in Michigan during 2010 season.

Species sought by tag holders	%	95% CL[a]	Total	95% CL[a]
Trapped only marten	7	1	114	16
Trapped only fisher	7	1	116	15
Trapped both marten and fisher	24	2	377	25
Trapped either marten or fisher	39	2	607	28
Trapped marten[b]	32	2	492	27
Trapped fisher[c]	32	2	493	27

[a]95% confidence limits.
[b]Sum of trappers that trapped only marten and trappers that trapped both marten and fisher.
[c]Sum of trappers that trapped only fisher and trappers that trapped both marten and fisher.

Table 2. Estimated number of trappers, trapping effort, marten captured (including all incidental catches and releases), marten released alive, and marten registered (including incidental catches) during the 2010 Michigan trapping season.

Type of trapper and county trapped	Trappers		Trapping effort (days)		Marten captured[a]		Marten released alive		Marten registered[b]	
	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]
Trappers that set traps targeting marten										
Alger	35	9	246	71	35	12	8	6	27	8
Baraga	55	11	270	64	45	11	5	4	41	10
Chippewa	69	12	396	84	58	13	8	5	50	11
Delta	15	6	157	61	2	2	0	0	2	2
Dickinson	11	5	143	65	0	0	0	0	0	0
Gogebic	33	8	264	75	14	6	2	2	12	5
Houghton	34	8	345	93	23	12	6	7	17	7
Iron	43	9	438	105	14	5	0	0	14	5
Keweenaw	11	5	92	47	9	5	2	2	8	4
Luce	57	11	336	76	47	11	2	2	46	11
Mackinac	22	7	143	58	8	4	0	0	8	4
Marquette	62	12	432	104	53	16	14	11	39	9
Menominee	9	4	101	50	2	2	0	0	2	2
Ontonagon	30	8	279	85	11	7	2	2	9	5
Schoolcraft	33	8	215	66	30	13	14	10	16	6
Unknown	3	3	8	9	0	0	0	0	0	0
Subtotal[d]	492	27	3,866	278	351	34	61	19	290	24
Trappers that captured marten in traps set to catch another species										
Alger	0	0	NA	NA	0	0	0	0	0	0
Baraga	2	2	NA	NA	3	4	3	4	0	0
Chippewa	6	4	NA	NA	11	7	11	7	0	0
Delta	2	2	NA	NA	9	11	9	11	0	0
Dickinson	0	0	NA	NA	0	0	0	0	0	0
Gogebic	0	0	NA	NA	0	0	0	0	0	0
Houghton	2	2	NA	NA	3	4	3	4	0	0
Iron	3	3	NA	NA	5	4	5	4	0	0
Keweenaw	0	0	NA	NA	0	0	0	0	0	0
Luce	3	3	NA	NA	6	6	6	6	0	0
Mackinac	3	3	NA	NA	3	3	2	2	2	2
Marquette	6	4	NA	NA	19	11	19	11	0	0
Menominee	0	0	NA	NA	0	0	0	0	0	0
Ontonagon	5	4	NA	NA	11	9	8	8	3	4
Schoolcraft	5	3	NA	NA	16	15	14	15	2	2
Unknown	0	0	NA	NA	0	0	0	0	0	0
Subtotal[d]	29	8	NA	NA	86	33	80	33	6	4
Grand total[d]	501	27	3,866	278	436	54	140	43	296	25

[a]All marten removed from traps, including all incidental catches and releases.
[b]Includes incidentally caught marten that were not returned to the trapper.
[c]95% confidence limits.
[d]Number of trappers does not add up to totals because trappers could trap in more than one county. Column totals for trapping effort and capture may not equal statewide totals because of rounding errors.

Table 3. Estimated number of trappers, trapping effort, fisher captured (including all incidental catches and releases), fisher released alive, and fisher registered (including incidental catches) by trappers during the 2010 Michigan trapping season.

Type of trapper and county trapped	Trappers		Trapping effort (days)		Fisher captured[a]		Fisher released alive		Fisher registered[b]	
	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]
Trappers that set traps targeting fisher										
Alger	27	7	217	71	8	4	0	0	8	4
Baraga	46	10	415	95	31	12	0	0	31	12
Chippewa	44	10	332	85	9	4	0	0	9	4
Delta	17	6	168	64	6	4	2	2	5	3
Dickinson	27	7	349	97	26	10	0	0	26	10
Gogebic	45	10	421	99	36	16	6	6	30	12
Houghton	42	9	451	108	37	16	6	7	31	12
Iron	49	10	494	110	31	10	6	4	25	9
Keweenaw	12	5	109	51	9	6	3	4	6	4
Luce	43	10	275	72	19	8	3	4	16	6
Mackinac	19	6	137	58	5	3	2	2	3	3
Marquette	71	12	547	105	53	17	8	5	45	13
Menominee	29	8	301	85	15	6	0	0	15	6
Ontonagon	45	10	496	114	56	17	2	2	55	17
Schoolcraft	28	8	222	72	12	7	5	4	7	4
Unknown	3	3	8	9	0	0	0	0	0	0
Subtotal[d]	493	27	4,942	332	353	40	42	14	311	34
Trappers that captured fisher in traps set to catch another species										
Alger	0	0	NA	NA	0	0	0	0	0	0
Baraga	2	2	NA	NA	17	12	9	11	0	0
Chippewa	0	0	NA	NA	0	0	0	0	0	0
Delta	2	2	NA	NA	14	16	0	0	0	0
Dickinson	0	0	NA	NA	0	0	0	0	0	0
Gogebic	5	3	NA	NA	6	4	3	3	3	4
Houghton	5	3	NA	NA	0	0	5	4	3	4
Iron	3	3	NA	NA	8	7	8	7	0	0
Keweenaw	3	3	NA	NA	17	17	3	4	0	0
Luce	5	3	NA	NA	5	3	5	3	0	0
Mackinac	2	2	NA	NA	3	4	3	4	0	0
Marquette	5	4	NA	NA	12	11	8	7	5	5
Menominee	2	2	NA	NA	2	2	0	0	2	2
Ontonagon	5	3	NA	NA	5	3	3	3	2	2
Schoolcraft	3	3	NA	NA	34	37	34	37	0	0
Unknown	2	2	NA	NA	2	2	0	0	2	2
Subtotal[d]	39	9	NA	NA	125	68	81	49	16	8
Grand total[d]	508	27	4,942	332	478	87	123	52	327	36

[a]All fisher removed from traps, including all incidental catches and releases.
[b]Includes incidentally caught fisher that were not returned to the trapper.
[c]95% confidence limits.
[d]Number of trappers does not add up to statewide total because trappers could trap in more than one county. Column totals for trapping effort and capture may not equal statewide totals because of rounding errors.

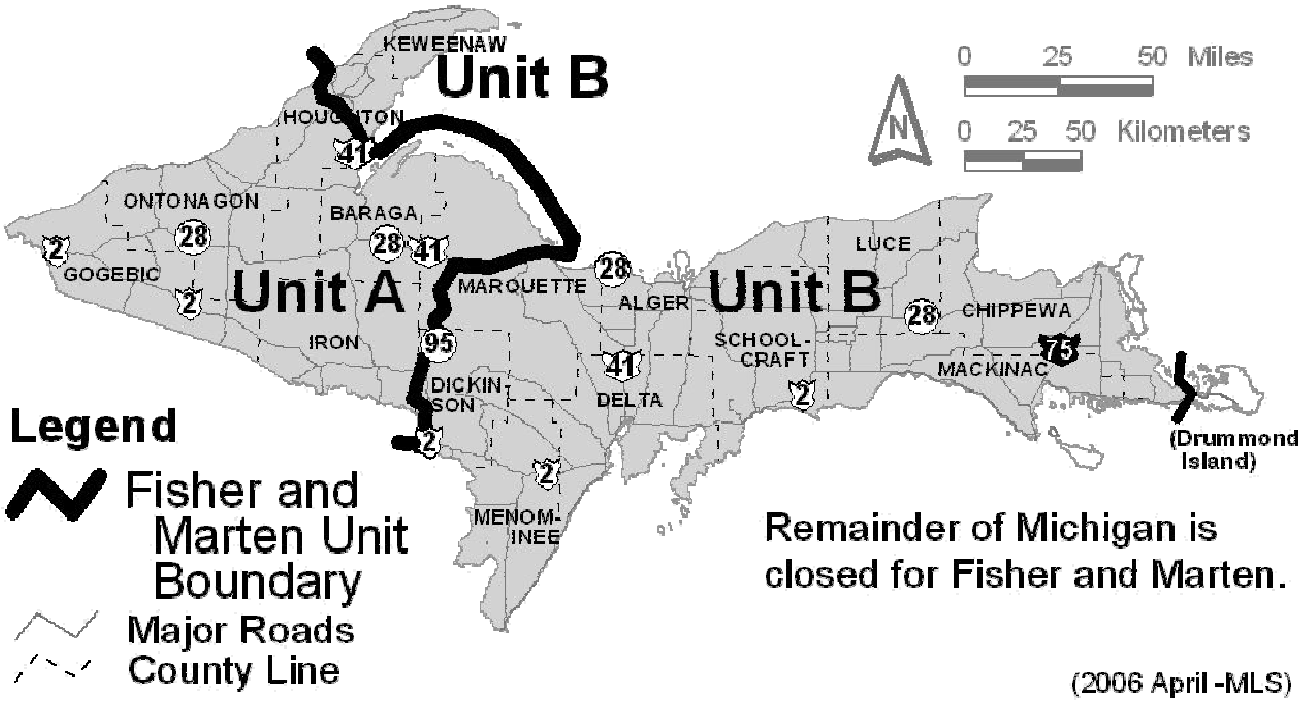

Figure 1. Marten and fisher management units in Michigan, 2010.

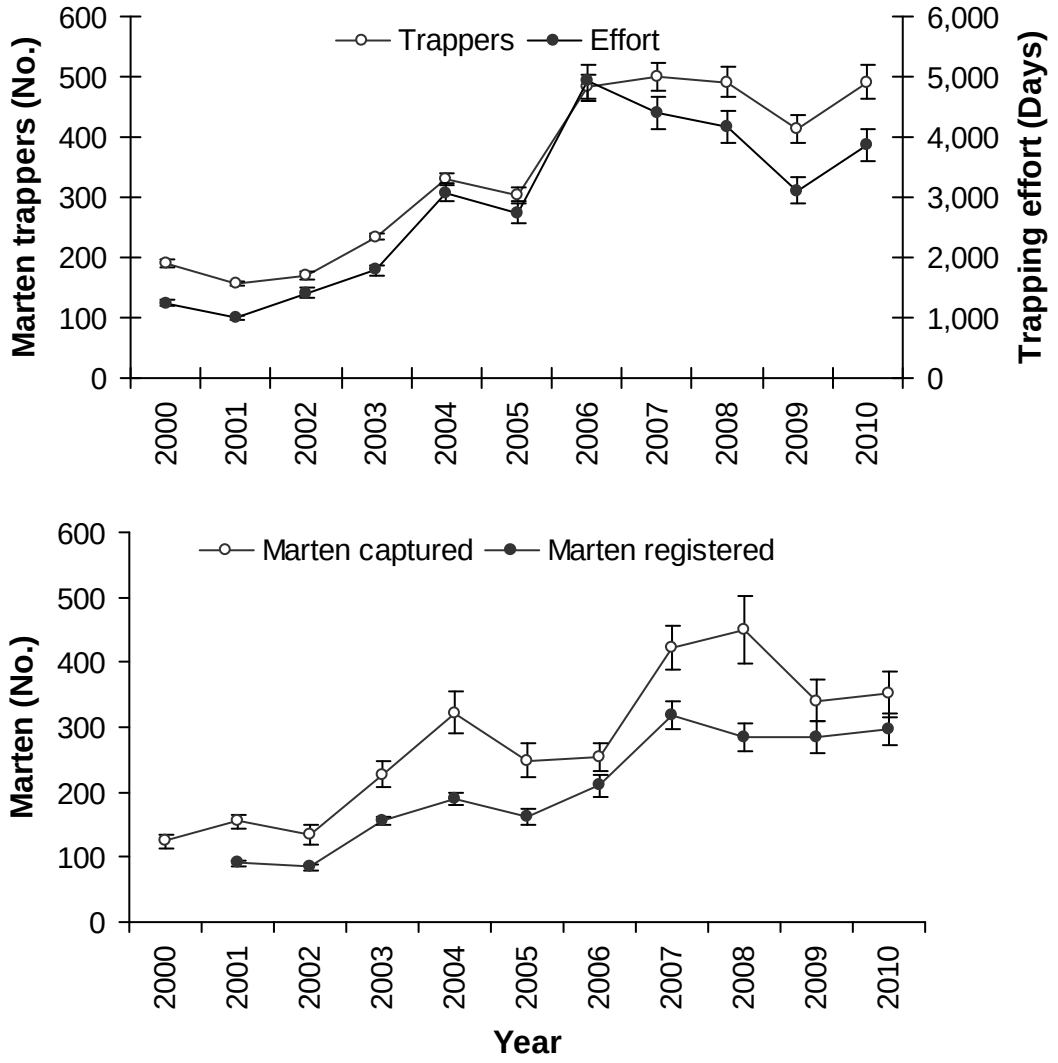

Figure 2. Estimated number of trappers, trapping effort (days), and number of marten captured and registered in Michigan, 2000-2010. Registration total was not estimated in 2000. Beginning in 2006, the estimates of marten captured and registered included incidental animals that the trapper was not allowed to keep; estimates from previous years excluded incidental animals. Estimates of trappers and effort included only trappers specifically targeting martens, but estimates of marten captured and registered included the take by all trappers (i.e., included marten taken by trappers not targeting marten).

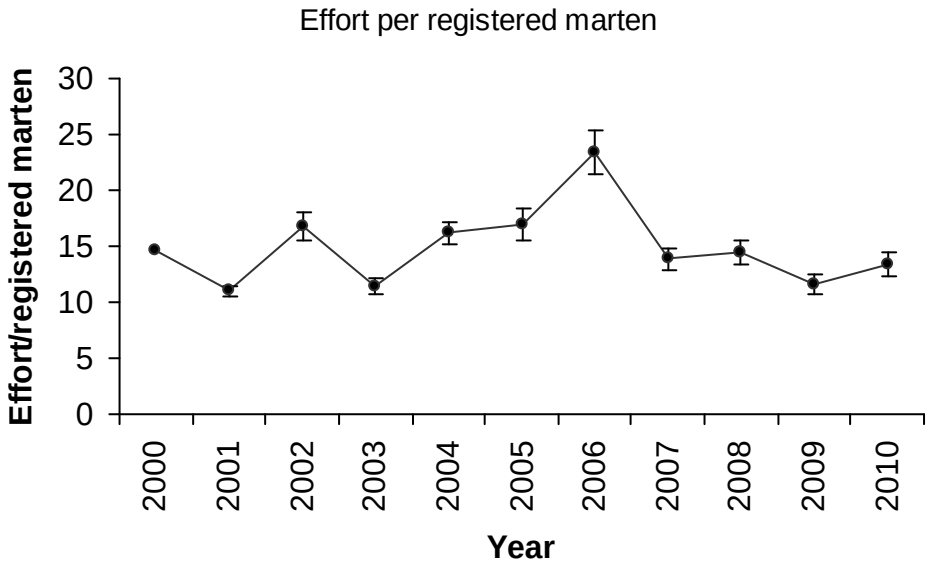

Figure 3. Estimated mean number of days required to harvest a marten in Michigan during 2000-2010. Vertical bars represent the 95% confidence interval. Estimates of effort/registered fisher included only trappers targeting fishers.

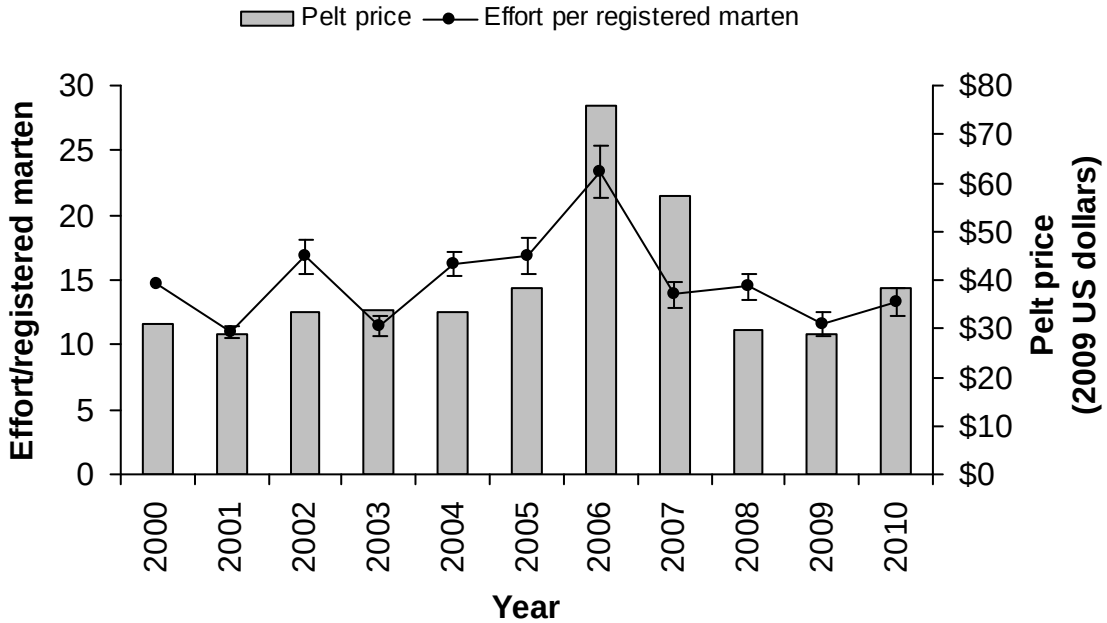

Figure 4. Estimated mean number of days required to harvest a marten in Michigan and the mean pelt value during 2000-2010. Vertical bars represent the 95% confidence interval. Pelt prices were the mean of values reported from Minnesota (Abraham and Dexter 2010). Pelt price were adjusted for inflation and reported in 2010 dollars. Estimates of effort/registered marten included only trappers targeting marten.

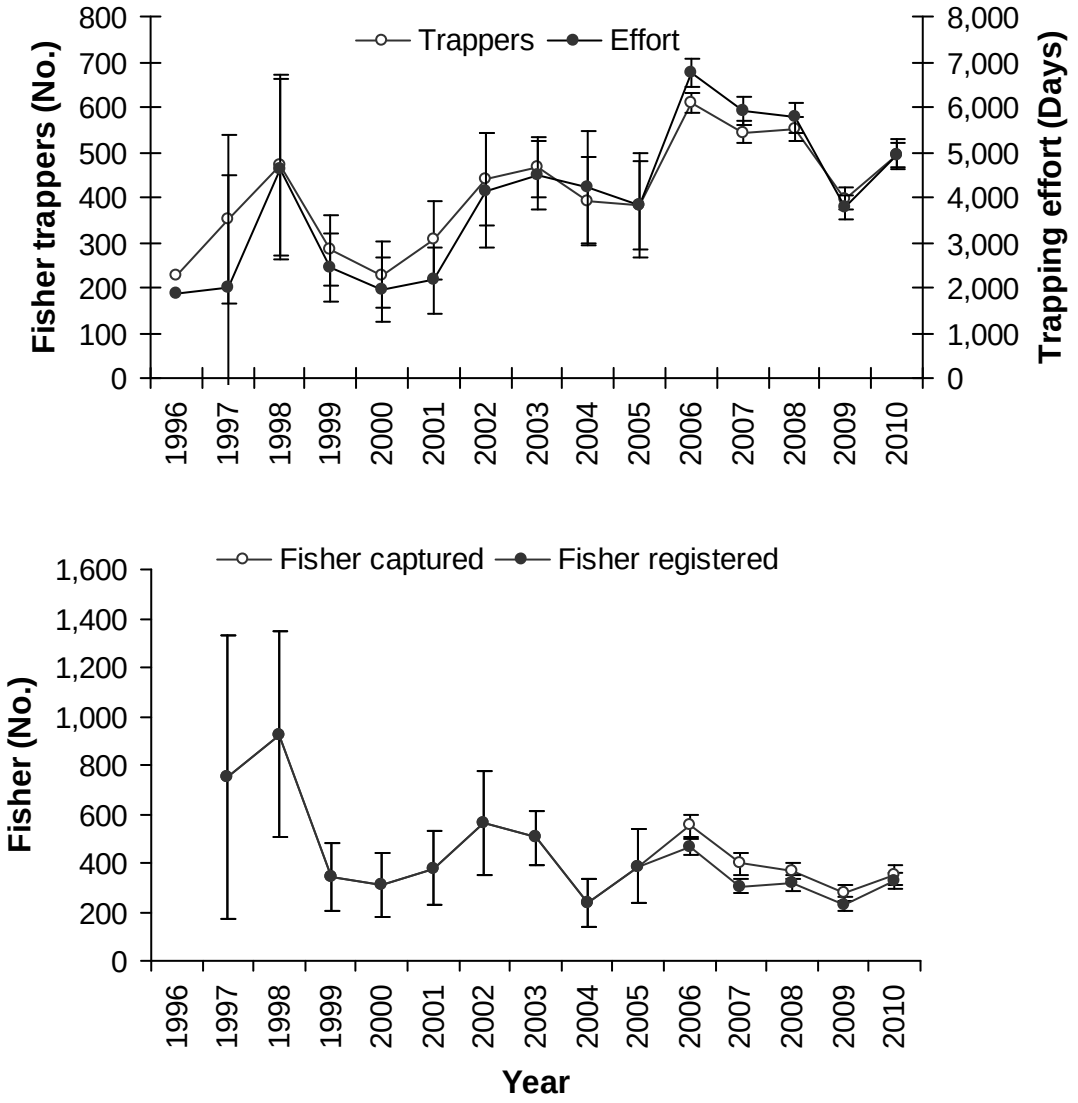

Figure 5. Estimated number of trappers, trapping effort (days), and number of fisher captured and registered in Michigan, 1996-2010. Estimates of trappers and effort included only trappers targeting fishers, but estimates of fisher captured and registered included the take by all trappers (i.e., included fisher taken by trappers not targeting fisher).

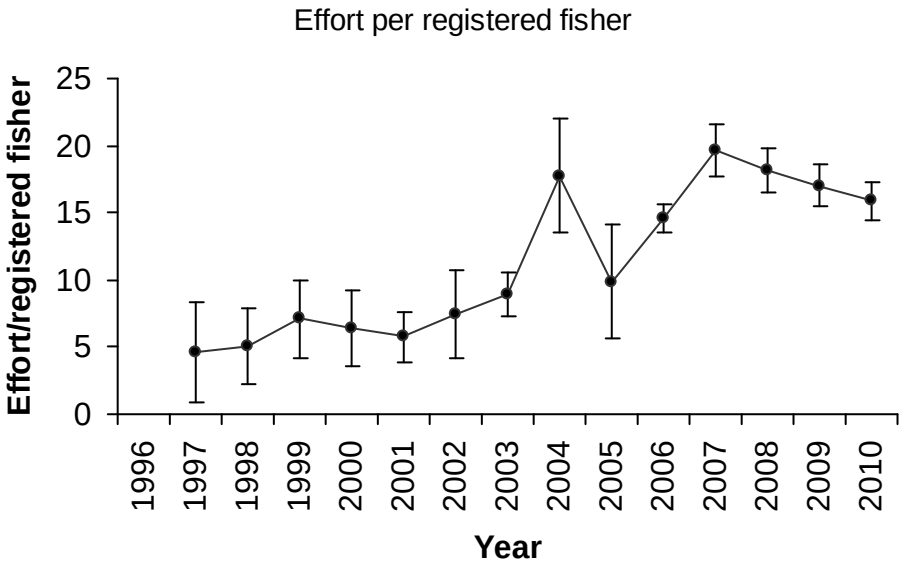

Figure 6. Estimated mean number of days required to harvest a fisher in Michigan during 1997-2010. Vertical bars represent the 95% confidence interval. Estimates of effort/registered fisher included only trappers targeting fishers.

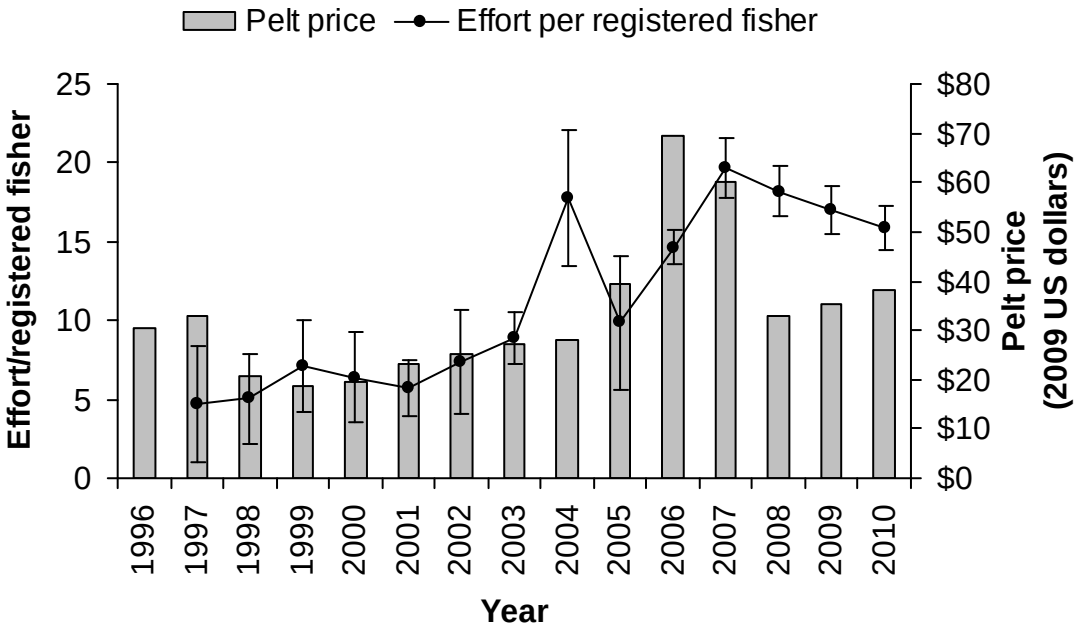

Figure 7. Estimated mean number of days required to harvest a fisher in Michigan and the mean pelt value during 1996-2010. Vertical bars represent the 95% confidence interval. Pelt prices were the mean of values reported from Minnesota (Abraham and Dexter 2010) and Wisconsin (Dhuey 2010). Pelt price were adjusted for inflation and reported in 2010 dollars. Estimates of effort/registered fisher included only trappers targeting fishers.